# BlueBRIDGE Workshop:
## "Towards innovative data services for Blue Growth"
### European Maritime Day 2016 Turku, 18 May 2016

*"A sustainable marine economy is not a dream, it is a reality. Now we need to move to the next level, and encourage blue growth more systematically. What ideas do you have on taking our sustainable blue economy forward?"* Karmenu Vella, Commissioner for Maritime Affairs and Fisheries, European Commission, 18 May 2016""".



*Figure 1 – A view of the conference.*

This year's European Maritime Day conference, hosted in Turku, Finland, 18-19 May 2016, was dedicated to "*Investing in smart and sustainable solutions for competitive Blue Growth*". The perfect setting to showcase the innovative technologies that BlueBRIDGE[1] is developing to support different stakeholders operating in the Blue Growth sector. The focus of the workshop was placed on the current challenges that Blue Growth sector data practitioners are facing and on their needs in terms of data management services.

The concluding session of the conference confirmed that currently **there is big gap between the Blue Growth sector and the ICT sector and immediate actions are needed**:

- *"Digitalisation is in the DNA of Blue Growth. It is not a choice, it is mandatory. It is comprehensively used to rethink services and optimize the total value chain."*
- *"The lack of data should not be used for lack of policy/governance decision. Business and civil society play a key role in data collection and sharing"*.

These are two of the outcomes from the European Maritime Day Reporting Back Session and this is **where BlueBRIDGE can make a difference and contribute concretely.**

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[1] Building Research environments fostering Innovation, Decision making, Governance and Education to support Blue growth, www.bluebridge-vres.eu

Nowadays, data are created by people or generated by machines, such as sensors gathering climate information, satellite imagery, digital pictures and videos, GPS signals, etc. **Generating value at the different stages of the data value chain is at the centre of the future Blue economy and only improved analytics and processing of data can increase the productivity of the sector, improve research and speed up innovation and achieve cost reductions. This is exactly the aim of BlueBRIDGE**.

During the workshop**,** through lightening talks[2] and a demo BlueBRIDGE representatives described the **tailor made data management services for the ecosystem approach to fisheries, the aquaculture and education sectors** that the project is developing. A particular focus was put on the services to address the challenges in **determining the location of aquaculture facilities** (this information can form the basis of national and/or regional inventories of aquaculture infrastructure and can support maritime spatial planning), **in understanding what is contained within managed areas** (for example marine protected areas) and in **supporting efficient stock assessment**.



*Figure 2 – The BlueBRIDGE Offer.*

All the above mentioned challenges and services have a common factor: **they all need capacities and tools to access, harmonise, discover, analyse and publish data.** BlueBRIDGE makes this possible thanks to its underlying hybrid data infrastructure[3] that can easily support capacity building (providing storage and cloud computing resources) and tailor made services (such as services for the identification of strategic locations in aquaculture).

These presentations set the scene for the interactive panel chaired by Phil Monbet, European Project Manager at Pôle Mer Bretagne Atlantique a sea innovation business cluster. The panel was composed by five renowned experts:

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[2] http://www.bluebridge-vres.eu/events/bluebridge-workshop-towards-innovative-data-services-blue-growth-european-maritime-day-2016
[3] D4Science, www.d4science.org

- Dr Ned Dwyer, Executive Director, EurOcean;
- Alejandro Iglesias-Campos, Programme Specialist, The Intergovernmental Oceanographic Commission of UNESCO (IOC/UNESCO);
- Scott Large, Professional Officer for Advisory Services, The International Council for the Exploration of the Sea (ICES);
- Miles Macmillan-Lawler – Marine Scientist, GRID-Arendal;
- Dr. Pasquale Pagano – Senior researcher CNR-ISTI & Technical Director, BlueBRIDGE.



*Figure 3 - N. Dwyer, EurOcean*



*Figure 4 - A. Iglesias-Campos, IOC/UNESCO*

The panel discussion was enriched by the contribution of **around 40 representatives from international organisations, private companies, research centres, universities and policy makers from the marine and maritime fields** who joined the workshop.

The main panel recommendations are:

1. **Virtual Research Environments (VREs) are the approach for the future to address the current data challenges of the Blue Growth sector.** Virtual Research Environments are web-based systems that provide users with secure access to collaborative tools, services, data and computational facilities. The experts and the audience fully endorsed the VRE approach adopted by BlueBRIDGE as it brings advantages in terms of costs reduction for the users and it improves the state of the art services for the marine domain at large.

2. **Building on existing e-infrastructures and re-using data produced by third parties is a must to deliver cost-efficient and added value services.** Alejandro Iglesias-Campos from ICO/UNESCO remarked that nowadays there are many authoritative data providers that are not fully exploited. Sometimes companies and organisations invest money and resources to collect and harmonise data that are already made available by others thereby wasting money and time. The existing resources should be re-used as much as possible in order to capitalise on previous investments. The demo illustrated how BlueBRIDGE provides seamless access to different data providers in a transparent way for users. It was also pointed out that service providers, like BlueBRIDGE, should encourage data providers to deliver indicators of the authoritativeness of their data to build trust with the users.

3. **The aquaculture sector is in great need of performance and environmental evaluation tools that also cover forecasting.** The experts highlighted that aqua-farming companies and investors need tools to support them in understanding the performance of their company and the identification of suitable locations for their farms. But it doesn't stop there, once the aquafarm is up and running it can be quickly destroyed by a jellyfish or an algae invasion. That's why monitoring systems and especially forecasting systems are fundamental for aquafarms to make informed strategic decisions for their businesses.

4. **Aquaculture is a local level business. To speed up the adoption of services, like those provided by BlueBRIDGE, end users must be taken into account and their expectations should be carefully managed.** Language has been identified as a potential barrier to adoption. Not all the end-users speak English. To be able to transfer knowledge in a correct and efficient way, the localisation and multilingual aspects must be considered and invested in.

5. **The sustainability of the services, like the ones provided by BlueBRIDGE, is key to stimulating adoption.** The audience recognised the added value of the solutions proposed by BlueBRIDGE

and stressed the importance of providing guarantees in terms of sustainability to the users. This is the only way these services can be adopted by different stakeholders and make a difference to the Blue Growth sector. Ned Dwyer from EurOcean also remarked on the importance of involving industry in the process, as research needs to bring innovation for Europe.

BlueBRIDGE has already started a sustainability study to make sure that after the end of the project (February 2018), its assets will be sustainable. This builds on solid foundations as the services developed for the ecosystem approach to fisheries and the related infrastructure resources will be maintained in the future by iMarine[4], the self-sustained initiative jointly supported by the Italian National Research Council (CNR), the Food and Agriculture Organisation (FAO) and a series of donors.

The workshop recommendations are fundamental for BlueBRIDGE to revaluate its strategy and plan its future directions but are equally as important for other initiatives operating in this domain. The importance of data and knowledge and the key role that digitalization has on the Blue Growth sector is a stimulant for BlueBRIDGE and other organisations to deliver high quality and efficient solutions for the sector.



*Figure 5 – BlueBRIDGE workshop view*

***Towards innovative data services for Blue Growth workshop was organised by BlueBRIDGE 18th May 2016 in Turku, Finland. Complete programme and presentations are available online[5].***

*The organisers are very grateful to the session speakers and panellists: Ned Dwyer, EurOcean; Alejandro-Iglesias-Campos, IOC/UNESCO; Scott Large, ICES; Miles Macmillan-Lawler, GRID-Arendal; Phil Monbet, Pole Mer Bretagne Atlantique; Pasquale Pagano, ISTI-CNR.*

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[4] www.i-marine.eu

[5] http://www.bluebridge-vres.eu/events/bluebridge-workshop-towards-innovative-data-services-blue-growth-european-maritime-day-2016

# The BlueBRIDGE workshop in a Nutshell

The BlueBRIDGE workshop focused on showcasing the innovative technologies provided by the project and on the challenges and needs that the Blue Growth sector data practitioners are facing. The program offered three presentations and a demo followed by a panel session.

The workshop was opened by Phil Monbet, Pole Mer Bretagne Atlantique who introduced the speakers and set the scene.
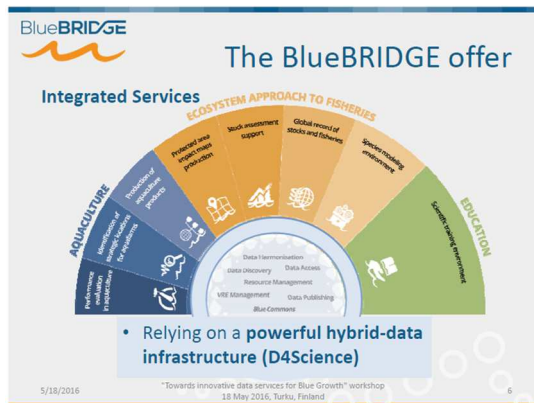


The first talk was given by Pasquale Pagano, ISTI-CNR and BlueBRIDGE Technical Director, who introduced the BlueBRIDGE concept & activities.
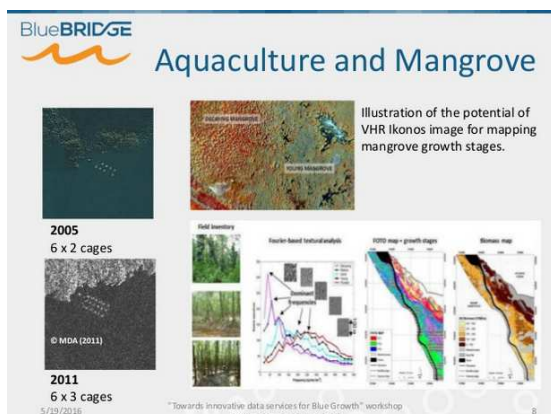
***BlueBRIDGE, Building research environments fostering Innovation, Decision making, Governance and Education for Blue Growth,*** delivers tailor made data management services to different communities (aquaculture, ecosystem approach to fisheries and research sector) and stakeholders (international organisations, research centres, enterprises, etc.).

The BlueBRIDGE services are operated through collaborative web-based research environments also referred to as Virtual Research Environments (VREs) built on top of a hybrid-data infrastructure (D4Science, www.d4science.org). BlueBRIDGE services are designed to serve different stakeholders not necessarily from the research sector. Currently international organisations, such as the Food and Agriculture Organisation of United Nations (FAO), and private companies such as the Integrated Information System SA (I2S) from Greece are using BlueBRIDGE.

BlueBRIDGE added value can be summarised as follows:

- Easy to use services to support researchers, companies (including SMEs) and international organisations;
- A self-sustained underlying infrastructure executing around 25,000 models and algorithms per month;
- Access to over a billion quality records hosted in more than 50 worldwide repositories and to more than 350 geo-referenced chemical and physical variables with global geospatial coverage and with 10 years lifespan through standard and recognized protocols;
- A unique consortium with the right expertise to support practitioners from multiple domains.

See the "BlueBRIDGE in a nutshell" presentation [http://www.slideshare.net/BlueBridgeVREs/bluebridge-in-a-nutshell](http://www.slideshare.net/BlueBridgeVREs/bluebridge-in-a-nutshell)



After this general introduction, Miles Macmillan-Lawler, from GRID-Arendal gave an overview of the Aquaculture Atlas Generation virtual research environment (VRE) being developed to address challenges in determining the location of aquaculture facilities and how this distribution changes over time. This information can form the basis of national and/or regional inventories of aquaculture

infrastructure and can support maritime spatial planning, which is a focus for many countries both within the EU and globally. The VRE will also facilitate the identification of habitats, such as mangroves, and allow a better understanding of the interactions between aquaculture and these habitats. The BlueBRIDGE infrastructure supports this by providing algorithms for analysing satellite imagery (Sentinel radar and optical imagery).

The second VRE - Protected Area Impact Maps VRE - addresses challenges in understanding what is contained within managed areas (for example marine protected areas). This is especially relevant given the Convention on Biological Diversity Aichi Target 11[6], through which countries have committed to protecting 10 per cent of their marine area, including the ecological and biological diversity. The VRE will analyse the representativeness of a range of environmental (seagrass, mangrove, coral reef and geomorphology) and human uses within managed areas and provide a report giving the representation of these features. The BlueBRIDGE infrastructure will support this through the provision of algorithms and data to support a standardised reporting mechanism.

See "The production of aquaculture and environmental maps to support spatial planning" presentation. http://www.slideshare.net/BlueBridgeVREs/the-production-of-aquaculture-and-environmental-maps-to-support-spatial-planning-62173155
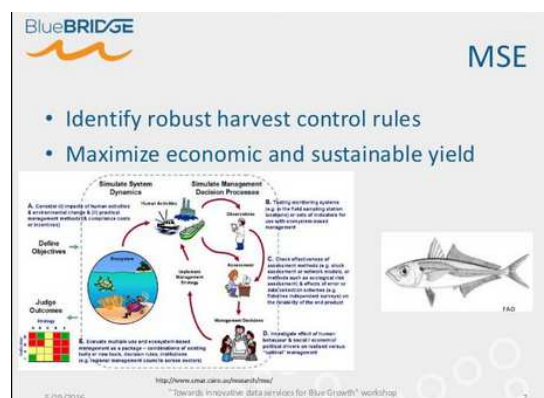


Scott Large, ICES Secretariat, presented an overview of the virtual research environments (VREs) being created to support stock assessment. The first VRE presented was the western horse mackerel Management Strategy Evaluation (WH-MSE) developed by José De Oliveira (CEFAS). This VRE explores how robust harvest control rules can be developed for this particular fish stock. These harvest control rules can be used to identify maximum economic and/or sustainable yield. The BlueBRIDGE infrastructure supports this by accelerating processing time to explore parameter space and to facilitate dissemination of results to other users. Currently, the VRE is in development, but once operational, it could be modified to accommodate Management Strategy Evaluations for other stocks. The second VRE on the mixed-fishery multi-species ensemble model was developed by Robert Thorpe (CEFAS). This VRE is being developed to identify and quantify trade-offs among fished species and between yield an ecosystem characteristics. The whole approach provides uncertainty intervals for management, which is highly desirable. The BlueBRIDGE infrastructure will support this model by accelerating processing time and will facilitate the development of this model in different ecosystems. See the "Assessing the state of stocks: challenges and opportunities" presentation http://www.slideshare.net/BlueBridgeVREs/assessing-the-state-of-stocks-challenges-and-opportunities-62181150

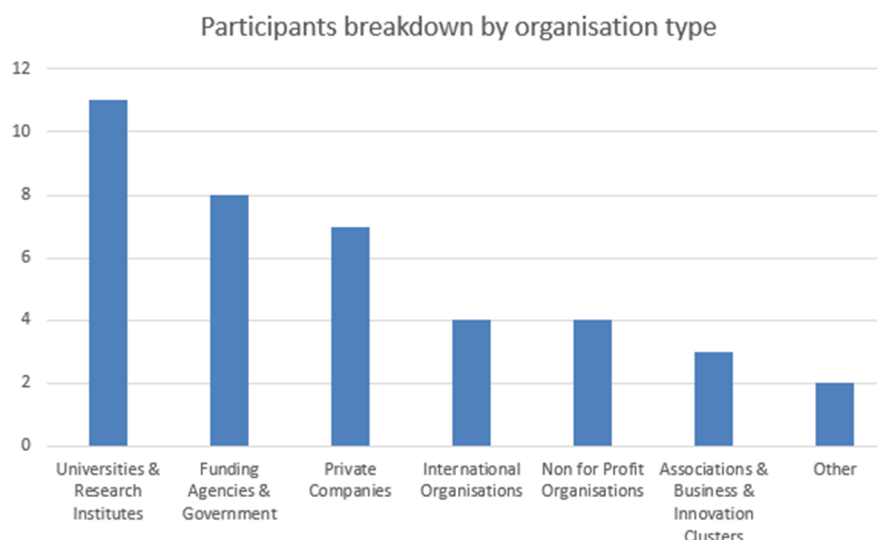The workshop closed with the interactive panel described in the introduction paragraph.

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[6] https://www.cbd.int/sp/targets/

## Who attended?

Over 40 international stakeholders participated to the BlueBRIDGE workshop (the complete list of participants is available at http://www.bluebridge-vres.eu/EMD2016workshop-participantlist) and a total of 14 countries were represented. The largest regional grouping came from Finland with 38%, much to be expected given the location of the meeting in Turku. Italy represented 13% of the participants, France 10% and Belgium 8%.



Participants break down by country
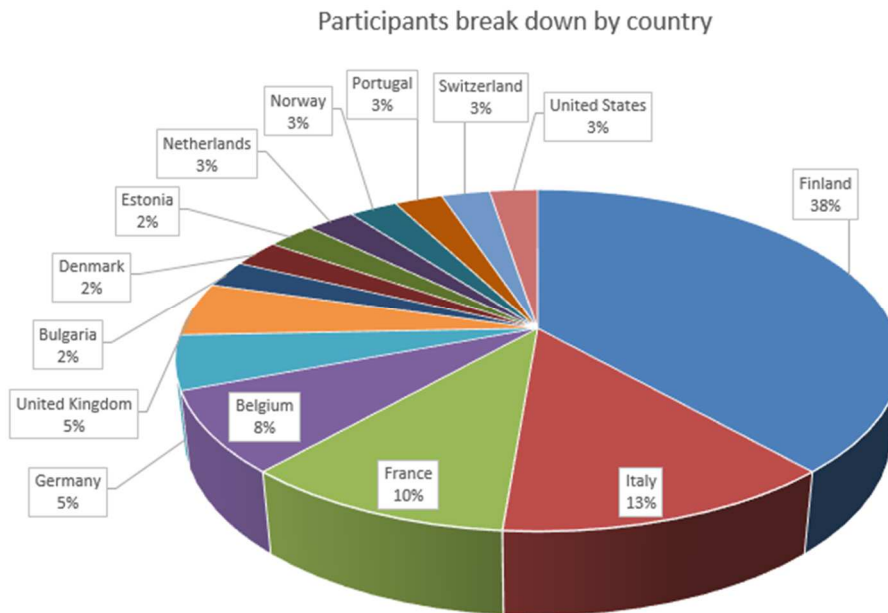
Representation from universities and research institutes was the highest, followed by funding agencies & government and private companies which reflects perfectly the main BlueBRIDGE target audience.



Participants breakdown by organisation type

## Programme:

The detailed programme, the speaker profiles and presentations are available at: http://www.bluebridge-vres.eu/events/bluebridge-workshop-towards-innovative-data-services-blue-growth-european-maritime-day-2016

# Participant List

The complete list of participants is available at http://www.bluebridge-vres.eu/EMD2016workshop-participantlist and reported below

| Name | Surname | Organisation | Country |
|------|---------|--------------|---------|
| Julia | AJANKO | turun yliopisto | Finland |
| Susanne | AUERBACH | Free University Berlin | Germany |
| Martina | BOCCI | Thetis | Italy |
| Bronwyn | CAHILL | SUBMARINER Network | Germany |
| Ned | DWYER | EurOcean | Portugal |
| Anna | ERSHOVA | Aquimer | France |
| Sara | GARAVELLI | Trust-IT Services | Italy |
| Valentin | GEORGIEV | GeoMarine Ltd. | Bulgaria |
| Max | GRÄFNINGS | Åbo Akademi University | Finland |
| Harm | GREIDANUS | European Commission - Joint Research Centre | Italy |
| Joonas | HOIKKALA | University of Turku | Finland |
| Asko | HORTTANAIEN | ForeC Advisors | Finland |
| Maria Luisa | IENNACO | European Parliament | Belgium |
| Alejandro | IGLESIAS-CAMPOS | The Intergovernmental Oceanographic Commission of UNESCO | France |
| Aarno | KOTILAINEN | Geological Survey of Finland | Finland |
| Scott | LARGE | International Council for the Exploration of the Sea | Denmark |
| Hee Sook | LEE-NIINIOJA | Journalist | Finland |
| Miles | MACMILLAN-LAWLER | GRID-Arendal | Norway |
| Cristina | MARTINEZ | Ecorys | Belgium |
| Anna | MÅTTS | Vaasa Region Development Company VASEK | Finland |
| Phil | MONBET | Pole Mer Bretagne Atlantique | France |
| Kari | OINONEN | Finnish Environment Institute SYKE | Finland |
| Pasquale | PAGANO | CNR-ISTI | Italy |
| Alina | PAWLOWSKA | ID-Gene Ecodiagnostics | Switzerland |
| Pietari | PENTINSAARI | Trafi | Finland |
| Matteo | POSTACCHINI | Università Politecnica delle Marche | Italy |
| Janne | POSTI | Marine Stewardship Council | Finland |
| Tom | REDD | JPI Oceans | Belgium |
| Roope | RITVOS | Forum Virium Helsinki | Finland |
| Anu - Maria | SANDELIN | Finnish Fish Farmers Association | Finland |

| Name | Surname | Organisation | Country |
|------|---------|--------------|---------|
| Willem | SCHOUSTRA | Ministry of Economic Affairs | Netherlands |
| Pasi | STAFF | Finnish Navy | Finland |
| Joonas | SYRJÄLÄ | University of Turku | Finland |
| Sam | TEDCASTLE | WWF UK - Celtic Seas Partnership | United Kingdom |
| Kristina | TIIVEL | Estonian Marine Institute | Estonia |
| Anaïs | TURPAULT | Pôle Mer Bretagne Atlantique | France |
| Joonas | VIRTASALO | Geological Survey of Finland (GTK) | Finland |
| Stephane | VRIGNAUD | U.S. NOAA | United States |
| Penny | WILSON | WWF-UK | United Kingdom |